



DIVISION OF  
CORPORATION FINANCE

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

August 31, 2010

VIA U.S. Mail and Facsimile

William S. Johnson  
Chief Financial Officer  
Cabot Microelectronics Corporation  
870 North Commons Drive  
Aurora, Illinois 60504

**Re: Cabot Microelectronics Corporation  
Form 10-K for the fiscal year ended September 30, 2009  
Filed November 24, 2010  
File No. 000-30205**

Dear Mr. Johnson:

We have reviewed your filing and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by providing the requested information or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances, please tell us why in your response.

After reviewing the information you provide in response to these comments, we may have additional comments.

Form 10-K for the fiscal year ended September 30, 2009

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, page 25

Critical Accounting Policies and Estimates, page 27

Business Combinations, page 29

1. We see that a portion of the purchase price for the acquisition of Epoch was allocated to in-process research and development. Please expand future filings to describe the nature of the acquired technology and how fair value was determined. Please also disclose the state of completion at acquisition and the extent of effort necessary to complete the in-process project(s), including costs. Disclose whether the technology was brought to fruition, and if not, disclose why not.

Goodwill and Intangible Assets, page 29

2. It appears based on your disclosure that you have more than one reporting unit. In future filings please disclose your reporting units. Please also discuss how you identified the reporting units and how you allocated goodwill to those reporting units.
3. We see that goodwill allocated to your QED subsidiary has been at risk for impairment. In future filings, for any reporting unit that is at risk of failing step one of the impairment test (e.g. it has a fair value that is not *substantially* in excess of the carrying value), please include the following disclosures:
  - Percentage by which fair value exceeded carrying value as of the date of the most recent test;
  - Amount of goodwill allocated to the reporting unit;
  - Description of the methods and key assumptions used and how the key assumptions were determined;
  - Discussion of the degree of uncertainty associated with the key assumptions. The discussion regarding uncertainty should provide specifics to the extent possible (e.g., the valuation model assumes recovery from a business downturn within a defined period of time); and,

- Description of potential events and/or changes in circumstances that could reasonably be expected to negatively affect the key assumptions.

Results of Operations, page 31

Year Ended September 30, 2009 Versus Year Ended September 30, 2008

Revenue, page 31

4. We note that you attribute a portion of the decrease in revenue to a change in product mix. In future filings, when you cite a change in product mix in explaining a change in revenues, please describe the nature of the change in mix in sufficient detail to explain the underlying impact on revenues and gross margins.

Liquidity and Capital Resources, page 35

Purchase Obligations, page 38

5. In future filings please clarify whether Cabot Corporation is a related party.

Item 8. Financial Statements and Supplementary Data, page 40

Note 2. Summary of Significant Accounting Policies, page 47

Revenue Recognition, page 50

6. We see that you market your products through distributors in certain markets. To the extent material, in future filings please expand to describe your revenue recognition practices with respect to distributors. As necessary to explain your policies, describe the significant terms of agreements with distributors, including price protection, payment, return, exchange, and other significant matters that impact the timing of revenues.
7. Please revise future filings to explain how you are notified when products held on consignment at a customer site have been consumed.
8. We see that within your ESF business you allocate a portion of the sales price to installation and training and that those amounts are deferred until the services are provided. Please revise future filings to explain how you apply FASB ASC 605-25 in allocating revenue to multiple elements.

Note 4. Fair Value of Financial Instruments, page 54

9. Please tell us where you have provided a reconciliation of the beginning and ending balances of level 3 investments, as required by FASB ASC 820-10-50-2(c).

Note 17. Commitments and Contingencies, page 68

Product Warranties, page 69

10. We see the significance of warranty settlements in 2009 and the related decrease in the warranty liability. In future filings, where material, please describe the facts and circumstances leading to significant settlements or changes in the accrual.

Note 19. Financial Instruments by Industry Segment and Geographic Area, page 72

11. Please tell us what consideration you gave to disclosing revenue by product line pursuant to FASB ASC 280-10-50-40. We see that you discuss revenues by product in your earnings conference calls.

Item 9A. Controls and Procedures, page 76

Evaluation of Disclosure Controls and Procedures, page 76

12. We refer to the disclosure of the conclusion regarding the effectiveness of disclosure controls and procedures. While you are not required to include the definition of disclosure controls and procedures when disclosing management's conclusion, if you do so, in future filings, please revise so that the language following the word "effective" is substantially similar to the full two sentence definition of disclosure controls and procedures as set forth in Exchange Act Rule 13a-15(e). Alternatively, please delete the language after the word "effective."

Management's Report on Internal Control over Financial Reporting, page 76

13. We see that control elements of Epoch that were not subject to your corporate level controls were excluded from management's assessment of the effectiveness of internal control over financial reporting. Please tell us why it was not possible to conduct an assessment of the acquired business' internal control over financial reporting in the period between the consummation date and the date of management's assessment. In this regard, we see that the acquisition occurred seven months before September 30, 2009. Refer to Question 3 of the Frequently

Asked Questions (revised September 24, 2007) on Management's Report on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports.

Changes in Internal Control over Financial Reporting, page 77

14. As a related matter, please tell us how you considered Questions 3 and 7 of the Frequently Asked Questions (revised September 24, 2007) on Management's Report on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports which indicates that notwithstanding management's exclusion of an acquired business from the annual assessment, you should also disclose any material change to internal control over financial reporting due to the acquisition pursuant to Exchange Act Rule 13a-15(d) or 15d-15(d).

Item 11. Executive Compensation, page 78

15. We note from your discussion under "Annual Cash Bonuses" on page 22 of the proxy statement that you have incorporated by reference into your Form 10-K that you have not disclosed the specific targets established as your Fiscal Year 2009 Company Performance and Annual Incentive Program Performance Goals used to determine whether your named executive officers earned their respective annual cash bonuses. Please tell us what these targets were and represent that you will provide such disclosure in your future filings, as applicable. While we note your disclosure in the first full paragraph on page 23, to the extent you believe that disclosure of such information, on a historical basis, would result in competitive harm such that the information could be excluded under Instruction 4 to Item 402(b) of Regulation S-K, please provide us with a detailed explanation supporting your conclusion. To the extent that it is appropriate to omit specific targets or performance objectives, you are required to provide appropriate disclosure pursuant to Instruction 4 to Item 402(b) of Regulation S-K. Refer also to Question 118.04 of the Regulation S-K Compliance and Disclosure Interpretations available on our website at <http://www.sec.gov/divisions/corpfin/guidance/regs-kinterp.htm>. In discussing how difficult or likely it will be to achieve the target levels or other factors, you should provide as much detail as necessary without disclosing information that poses a reasonable risk of competitive harm.

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We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

You may contact Kristin Lochhead at (202) 551-3664, Gary Todd at (202) 551-3605 or me at (202) 551-3676 if you have questions regarding comments on the financial statements and related matters. If you have other questions, please contact Joe McCann at (202) 551-6262 or Jay Mumford at (202) 551-3637.

Sincerely,

Brian Cascio  
Accounting Branch Chief